TECHNICAL NOTES

LAKE STATES FOREST EXPERIMENT STATION
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Timber Blowdown Hazard in the Rainy River Section of Northern Minnesota

The need for better information on windstorm hazards is recognized by most managers of forest land. Unfortunately, few data are available on this subject. Although northeastern Minnesota has not generally been considered a region that regularly experiences really strong winds, occasional storms have caused widespread or sporadic blowdown. Storms such as those of June 7 and 8, 1954, and October 10, 1949, are well remembered. However, whether storm losses from heavy winds are "normal" and must be planned for, or are unusual situations that may not recur for many years, has been uncertain.

To obtain information on this point, a study was made of Weather Bureau records at International Falls where wind velocity and direction data have been kept since 1946. The blowdown of June 7 and 8, 1954, was associated with sustained winds of 36 miles per hour and gusts to 54 miles at International Falls. A check of ranger stations in the surrounding area indicated that sustained winds did not exceed 36 miles, but gusts up to an estimated 72 miles per hour were recorded at Baudette. Winds in the October 10, 1949, storm reached 48 miles per hour at International Falls, with gusts up to 60.

These data indicate that sustained winds of 35 to 40 miles per hour with gusts to 50 or 60 will have sufficient force to cause some blowdown. According to the records, nine such storms occurred at International Falls in the 8½ years from January 1946 to July 1954. Only 2 years (1947 and 1951) failed to have at least one storm of this force (see table on reverse side).

Assuming that the study period is average, it appears that windstorms are in fact a normal hazard in the Rainy River area. Evidently some windfall must be expected nearly every year.

Much of the loss is known to occur in exposed stands. Overmature trees, trees with unstable root systems, and trees with butt or stem rot are especially susceptible to damage. Because exposure is a recognized hazard, an attempt was also made to determine the direction from which strong winds most frequently blow. Of 39 winds in excess of 30 miles per hour, 33 (or 85 percent) attained their peak velocity from a westerly quarter--that is, from the northwest to the southwest. Seven of the nine winds over 35 miles per hour were also from a westerly quarter (see table). Evidently, stands exposed on the west are especially liable to windfall. In marking timber for cutting, therefore, the forester should avoid creating large openings on the west edge of the stand whenever possible, especially in situations where rooting is shallow. Trees which show evidence of butt or stem defects should be removed.

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MAINTAINED AT ST. PAUL 1, MINNESOTA, IN COOPERATION WITH THE UNIVERSITY OF MINNESOTA

Storms with winds of 35 or more miles per hour at International Falls, Minnesota, January 1946 to July 1954[1/]

Year	Date	Maximum sustained velocity	Maximum velocity of gusts	Direction at maximum velocity
		Miles per hour	Miles per hour	
1946	9-27	38	42	WSW
1948	2-19	38	(2/)	NW
1948	7-30	36	(2/)	WNW
1949	10-10	48	60	WSW
1950	6-25	36	(2/)	ENE
1952	11- 5	36	(2/)	WNW
1953	4-22	40	55	WNW
1953	6-21	35	50	W
1954	6- 8	36	54	S

1/ Data from records of U. S. Weather Bureau, International Falls, Minnesota.

2/ Gusts not recorded for these storms.